

Passive Wireless Cryogenic Liquid Level Sensors Using Orthogonal Frequency Coded Acoustic Wave Devices, Phase II

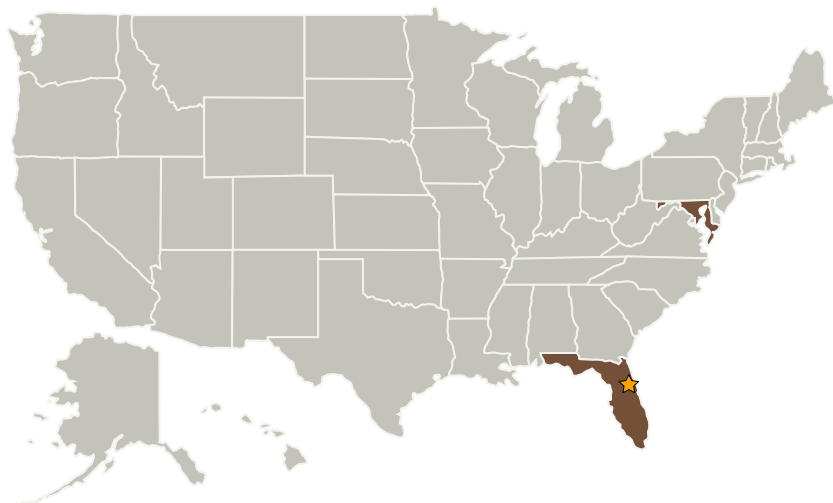
Completed Technology Project (2007 - 2009)



Project Introduction

This proposal describes the continued development of passive wireless surface acoustic wave (SAW) based liquid level sensors for NASA application to cryogenic liquid level sensing. Orthogonal Frequency Coded (OFC) SAW devices have been demonstrated as passive wireless temperature sensors in NASA Contract NNK04OA28C, and are being further developed under NNK05OB31C. The liquid level sensors use damping of the acoustic wave caused by mass loading of the liquid to produce fast, reversible liquid level sensors. The Phase I research successfully demonstrated operation of these devices as liquid level sensors in selected liquids of interest at cryogenic temperatures. Stability of selected commercially available SAW devices was confirmed, both when exposed to various (extreme and gradual) temperature changes, and upon repeated exposure to liquid nitrogen. The reversibility of the device response was confirmed. Phase I demonstrated the technical feasibility of using these sensors for cryogenic liquid level monitoring of low to moderate pressure liquids (under 500 psi). Phase II will result in prototype product development.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
SenSanna Incorporated (formerly Applied Sensor Research & Development)	Supporting Organization	Industry Women-Owned Small Business (WOSB), Veteran-Owned Small Business (VOSB)	Arnold, Maryland

Primary U.S. Work Locations

Florida	Maryland
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.3 Cryogenic